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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/526,003	02/25/2005	Helmut Seidlitz	HAFTOM P02AUS	9610
20210 7590 06/03/2009 DAVIS & BUJOLD, P.L.L.C. 112 PLEASANT STREET CONCORD, NH 03301				
EXAMINER				
DRODGE, JOSEPH W				
ART UNIT		PAPER NUMBER		
1797				
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06/03/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/526,003

**Applicant(s)**

SEIDLITZ ET AL.

**Examiner**

Joseph W. Drodge

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 April 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 9, 11 and 13-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9, 11 and 13-17 is/are rejected.
- 7) ☒ Claim(s) 18 and 19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 9,11 and 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Podbielniak patent 2,281,796 in view of Vaughan patent 2,819,015 and also in view of Kanel et al patent 6,106,720 and DeFilippi et al patent 4,349,415 (newly recited).

Podbielniak discloses: a method and device for extracting impurities from liquids such as lubricating oils, using compressed solvents in counter-current contact and contact with carbon

dioxide that may be in the form of a vapor (page 3, at column 1, lines 1-11 and 57-67), applying the countercurrent-contacting liquids as a thin film (page 2, lines 28-36) in a pressurized (pressure-tight) manner (column 2, lines 65-75 of page 2 and see page 2 at column 2, lines 57-65 concerning sealing), mechanically acting on the liquid as it flows as a film by flow action of the rotor (page 2, column 2, lines 28-36), the liquid being treated, solvent liquid and carbon dioxide all being separately discharged (carbon dioxide by lines 21/51 – page 3, line 11), (liquids through collecting line and openings 29 – page 2, line 35 etc.).

The provided device contains oppositely oriented introduction and discharge ports or openings 12 and 18 (page 1, column 1, line 40-page 2, column 2, line 8); also see page 3, column 2, lines 65-68 concerning openings for introduction of heavier and diverse lighter liquids into the countercurrent, column device.

The device provided may also be utilized to extract impurities or other constituents from liquids by solvent extraction, the liquids may be immiscible with each other or concern refining of lubricating or refining oils (page 1, column 1, lines 4-10 and page 3, column 2, lines 57-67).

The claims differ in requiring that the carbon dioxide be in liquid or supercritical form. However, Kanel et al teach solvent extraction utilizing such liquid/supercritical carbon dioxide and expounds upon a plethora of advantages of using such (columns 1-2, etc.) and concerns solvent extraction for treating oils (page 5, lines 24-53 or column 1, lines 54-63) and extraction using columnar vessels, countercurrent flow and varied internal agitation and mixing implements (column 6, lines 35-45 and column 6, line 54-column 7, line 7). It would have been obvious to have modified the Podbielniak method and device, by either employing the carbon dioxide in liquid/supercritical form, or employing such carbon dioxide as alternative to the disclosed

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solvents, as taught by Kanel et al, since such form of carbon dioxide has greatly enhanced salvation power.

The claims differ in requiring that the carbon dioxide be in liquid or supercritical form and be used for solvent extraction as the extracting agent. Podbielniak may be utilized to extract impurities or other constituents from liquids by solvent extraction, the liquids may be immiscible with each other or concern refining of lubricating or refining oils (page 1, column 1, lines 4-10 and page 3, column 2, lines 57-67) However, Kanel et al teach solvent extraction utilizing such liquid/supercritical carbon dioxide and expounds upon a plethora of advantages of using such (columns 1-2, etc.) and concerns solvent extraction for treating oils (page 5, lines 24-53 or column 1, lines 54-63) and extraction using columnar vessels, countercurrent flow and varied internal agitation and mixing implements (column 6, lines 35-45 and column 6, line 54-column 7, line 7). Kanel refers to incorporating DeFilippe at column 5, lines 33-34; DeFilippe also concerning countercurrent solvent extraction utilizing supercritical or liquid carbon dioxide and employment in refining of hydrocarbon oils (column 1, lines 19-22; column 3, lines 49-68 and column 6, lines 20-43). It would have been obvious to have modified the Podbielniak method and device, by employing carbon dioxide in liquid/supercritical form as a solvent for solvent extraction, as taught by Kanel et al and DeFilippi et al, since such form of carbon dioxide has greatly enhanced salvation power, is suitable for separating hydrocarbon azeotrope mixtures, is energy efficient, and can be readily separated from the solvent/extract mixture and recycled. These advantages are purported in both DeFilippe and Kanel.

The claims all now also differ in requiring that the rotor carry both radial arms and rods, scrapers, wipers or rollers that extend axially or in the direction of axis of rotation of the rotor. Vaughan teaches, in a solvent extraction device (column 1, lines 22-35), to employ a cylindrical rotor (9/60/62) having vanes 12, and annular arms 53 that extend radially from the rotor and also vanes (rods) that extend axially from and between the arms along the rotors (column 3, lines 15-35). Both DeFilippe (column 6, lines 23-26) and Kanel (column 6, lines 62-63...column 7, line 5) explain that agitation is desirable. It would have been thus also obvious to have utilized the arms and axially extending rods/vanes of Vaughan to the Podbielniak method and device, in order to form enhanced mixing action to contact the entire liquid flow volume in the Podbielniak device and method with solvent and carbon dioxide, thus increasing rate of extraction of impurities into the solvent.

Podbielniak discloses that the column is cylindrical for claim 13, and has sealing lids 17 with flanges at opposite ends for claims 15 and 16.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Podbielniak patent 2,281,796 in view of Vaughan patent 2,819,015, and further in view of DeFilippi et al patent 4,349,415 (newly recited) and Kanel et al patent 6,106,720, as applied to claims 9,11 and 13-17, and further in view of Holl patent 6,752,529 of record. Claim 14 also requires rotor being driven/connected to magnetic coupling. Holl suggest such magnetic coupling (column 5, lines 42-55) in a device for reacting liquids with high speed rotor. It would have been further obvious to have utilized the magnetic coupling of Holl to drive the Podbielniak rotor, in order to maintain

a faster rotational speed of rotor and blades so as to effect a faster more thorough mixing and contacting.

#### ALLOWABLE SUBJECT MATTER

Claims 18 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 18 would distinguish in view of recitation of simultaneous adjusting of thickness of the thin film and promotion of its axial movement by means of rollers having helical, conical, convex or concave profile.

Claim 19 would distinguish in view of recited radial arms rotationally supporting axially aligned rollers having helical, conical, convex or concave profile.

Applicant's arguments filed on 16 April 2009 have been fully considered but they are not persuasive, especially in view of the modified grounds of rejection, and are fully addressed.

It is averred that Podbielniak has no suggestion whatsoever of applying the disclosed device to solvent extraction. However, page 3, column 2, lines 57-67 explicitly disclose the device being employed in solvent extraction processes such as with hydrocarbon oils or lubricating oils. Kanel at column 5, lines 23-40 teach solvent extraction using carbon dioxide as a solvent for crude or petroleum oils, and in extraction apparatus employing countercurrent liquid contact and forms of agitated columns such as employed in Podbielniak (column 6, line 24-column 7, line 7). Similarly, it is maintained that the reference is only directed to removing

constituents from gases. However, page 3, column 2, lines 57-67 again is drawn to removing constituents from one liquid to another liquid in countercurrent contact.

It is relatedly argued that the apparatus of Podbielniak would not be operative in the high pressures necessary for solvent extraction employing carbon dioxide since liquid seals are employed. However, page 2, column 2, lines 65-67 teach that the apparatus may be employed under any suitable pressures other than atmospheric with no limit to pressures being expressed.

It is maintained that in Podbielniak, carbon dioxide is merely used as an inert gas to aid in building up pressure, and not utilized as a solvent. Such argument is persuasive and acknowledged as correct; however, DeFilippe and Kanel extensively teach advantages of using carbon dioxide as a solvent for solvent extraction in devices using countercurrent flow and agitation, and the solvent extraction specifically utilized for similar liquid mixtures that may undergo countercurrent solvent extraction in the Podbielniak process and apparatus.

It is argued that no motivation is present for including the agitating devices of Vaughan in the method and device of Podbielniak; however both DeFilippe and Kanel teach to utilize agitation in counter-current solvent extraction columns, as is one optional use of the device of the primary reference. The extent of the "several structural features that are not in any way....taught" concerning arguments to claim 11 is not known. If this refers to openings or ports of the device, all four applied references disclose and teach a plurality of ports, not only at both ends of the column, but also at intermediate locations.



**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Drodge at telephone number 571-272-1140. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith, can be reached at 571-272-1166. The fax phone number for the examining group where this application is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either private PAIR or Public

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PAIR, and through Private PAIR only for unpublished applications. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have any questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JWD

June 2, 2009

/Joseph W. Drodge/

Primary Examiner, Art Unit 1797